

METHODS AND APPARATUS FOR HIGH-SHEAR MIXING AND REACTING OF MATERIALS

ABSTRACT

Methods and apparatus for high shear reacting and/or mixing of moving fluid streams of materials employ an interdiffusing and reacting zone formed in the space between two stationary surfaces, the surfaces being spaced apart a maximum distance of the sum of the thicknesses of the back-to-back boundary layers of the materials and/or resulting materials on the surfaces, to a value such that any third layer between the two boundary layers is too thin to support agitation characterized by turbulent convection and/or to cause channeling. The materials are interdiffused by high speed laminar shear produced by the flow of the materials rather than mixed by macroscopic convection, the materials being driven by high velocity inlet feeds, auxiliary high pressure gas flow pumped into the reaction/mixing zone, or auxiliary high pressure gas flow created as an evolving gaseous byproduct of any chemical reaction that may occur.